WHAT IS CLAIMED IS:

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- 1. An optical transmission system comprising:
- a signal light source outputting signal light
 with a positive chirp;
- an optical fiber transmission line through which the signal light propagates; and
- a lumped Raman amplifier provided between said signal light source and said optical fiber transmission line, and Raman-amplifying the signal light outputted from said signal light source, said lumped Raman amplifier including a high-nonlinearity fiber having a negative chromatic dispersion at a wavelength of the signal light and a nonlinear coefficient (2 π / λ)·(n₂/A_{eff}) of 6.9 (1/W/km) or more which is defined by a nonlinear refractive index n₂ and an effective area A_{eff} at a wavelength of λ .
- 2. An optical transmission system according to claim 2, wherein a phase shift amount Φ_{LRA} of the signal light in said high-nonlinearity fiber is 1/2 or more of a phase shift amount Φ_{T} of the signal light in said optical fiber transmission line.
- 3. An optical transmission system according to claim 1, wherein the nonlinear coefficient (2 π / λ) (n₂/A_{eff}) of said high-nonlinearity fiber is 12.2 (1/W/km) or more.
 - 4. An optical transmission system according to

claim 1, wherein said high-nonlinearity fiber has a transmission loss of 0.7 dB or less at a wavelength of 1500 nm.

5. An optical transmission system according to claim 1, wherein said high-nonlinearity fiber has a transmission loss whose increase, to which OH-absorption near a wavelength of 1390 nm contributes, is 0.5 dB/km or less.

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- 6. An optical transmission system according to claim 1, wherein said high-nonlinearity fiber has a chromatic dispersion of -20 ps/nm/km or less at the wavelength of the signal light.
- 7. An optical transmission system according to claim 1, wherein the signal light includes a plurality of signal channels having a wavelength spacing of 10 nm or more, and said high-nonlinearity fiber ha a chromatic dispersion of -10 ps/nm/km or less at the wavelength of the signal light.